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TITLE:

Mobile communication station for mobile radio network
has transmitted time information used directly or for
synchronisation of incorporated clock function or
separate clock component

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ABSTRACT:

CHG DATE=20021203 STATUS=O>The mobile communication station has an incorporated clock function or a separate clock component, with evaluation of transmitted time information for providing the year, month, day of the month, day of the week, hours, minutes, seconds, or time zone, for synchronisation of the clock function or clock component. The time information may be stored and used directly, e.g. for providing an alarm call. An Independent claim for a base station for a mobile radio network is also included.



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Clocks over radio to synchronize is a widespread technology. It becomes z. B. in commercial radio clocks uses, which adjust their internal clock always the time information conveyed by a standard time transmitter. For this there is extensive literature, an overview of relevant patents finds one in the article of Dr. rer. nat. Udo Ditté, ?from navigation to the radio clock at the wrist?, S. 18-21, in ?inventor activities?, of the German patent and office for mark published special edition to the annual report 1999.

The transmission of time information with detailed telephone calls in the line-bound telephone network is state of the art. This characteristic is used by devices like by the company Conrad refugee TOPCOM call master 250 to place an internal clock.

Into portable radio nets (GSM, UMTS. . .), which correspond to the today's state of the art, the information exchanged between basis station and mobile station is digitally conveyed. The capacity of this air interface, with which mobile stations with basis stations stand in connection, moves within the range of k-bit per second and more. Information, from itself the exact time, the date or the time belt to determine lets not transfer, after knowledge of the inventor. The basis stations stand for telephone network with that in connection.

Many mobile stations, which are used in portable radio nets (mobile telephones, Kommunikatoren), contain a clock. Thus this equipment, separate-ends information can indicate the time with time stamps to provide or from the time dependent activities drove out.

The invention indicated in the patent claim is the basis the problem that the time for different reasons, supplied by the clock, can be wrong, z. B. because of wrong attitude of the time by the user, course inaccuracies, conversion between summer and winter time, changes of the time belt and. A.

With the invention it is to be achieved that the mobile station exterminates over the correct time, without an interference is necessary by the user. The applied procedure to convey the time information about the air interface has the further advantage that no additional receiver is needed approximately for Zeitzeichensender. Thus good chances, mobile stations, which exterminate over no synchronisation possibilities for their clock, exist by new firmware in such a way change that they can synchronize their clocks with over the radio net supplied time-normally.

The invention consists of the fact that a mobile station according to requirement 1, which stands with a basis station according to requirement 2 over an air interface in connection, receives information over the current time. Thus it is able to adjust their own clock on the time valid for the current radio cell or to use also the time information directly.

If one assumes that a 4-digit year, hour, a minute and a second will transfer and additionally in addition information, which selects one of maximally 64 time belts, then 36 bits are sufficient; there $2^{36} = 68$ for the transmission this information. $719.476.736 > 55.290.470.400 = 9999.24.60.60.64$ is. If one does without the first two places of the year and is limited to full minutes, then already 24 bits for the transmission of the time information are enough. For a transmission of time information once per minute therefore an information capacity would be in the order of magnitude of $24/60. . . 36/60$ bit per second, thus less than a bit per second necessarily. The capacity of the air interface is higher around several orders of magnitude. One can therefore assume a transmission of time information without noticeable impairment of the functions of the mobile station is technically possible.

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